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District Extension Agent, Crops & Soils

N Sources and Cool Season Grass Fertilization

When evaluating nitrogen (N) sources for cool season grass fertilization, the ‘simple’ answer is: if equivalent pounds of N are applied, the yield response to the source should be very similar. Unfortunately, ‘simple’ isn’t how fertilizer applications in nature typically work.

The complications of comparing N sources for cool season grass production have a lot to do with the environment into which they are applied. Grass covered soil surfaces typically have varying degrees of partially decomposed litter that may inhibit granules from reaching the soil surface and dissolving into the soil profile prior to losses (typically volatilization...) occurring. Appropriate moisture levels can also be an issue –not enough moisture (a half-inch or so, typically...) or too much all at one time can increase N losses, too. It’s why even when we apply *equivalent* N rates, we don’t always observe equivalent N *responses*.

Here, we’re typically comparing urea and ammonium nitrate as our N sources, sometimes based on price and sometimes simple availability. Once we sort through those two things, the question becomes: what about performance? Previous work at Kansas State University looked at brome and fescue fertility plots receiving either urea or ammonium nitrate to find out.

In the brome studies, both sources were applied to their respective plots over several years at the same equivalent N rate. Only in year two of the study did forage production favor ammonium nitrate over urea with the other study years and production over the seven-year study were nearly equal between sources. Bottom line: when applied *appropriately*, either urea *or* ammonium nitrate can be surface applied on well drained Kansas soils with little loss potential or *expected* production differences. While ‘appropriately’ can differ from year to year based on weather, it typically means applications to *non-frozen* soils from November through early March when conditions are less conducive for volatilization losses.

When not applied appropriately or extenuating circumstances result in conditions we did *not* plan on, losses can and do occur (one study of N loss when one inch of water was applied to a frozen soil just following application of urea and ammonium nitrate found losses approaching 25% in runoff water for *both* sources). Knowing these differences is a good reminder to plan ahead to best manage everything from product selection to application timing and even the need for product inhibitors to mitigate risk as needed.

Ross Mosteller
District Extension Agent, Livestock & Natural Resources

Bovine Virus Diarrhea

As we enter February it may not yet be a new season on the calendar, but we are entering two “seasons” in the cattle world... calving and bull buying season. Flipping through bull sale catalogs, it is not uncommon to see breeders noting that bulls have been tested BVD PI negative. BVD is a big deal to the industry, so today let’s dig in and take a look at this viral disease.

Bovine Virus Diarrhea (BVD) is one of the most significant viral infections of cattle. BVD was first recognized as a disease syndrome in 1946. Most BVD virus (BVDV) infections are subclinical, but the clinical disease can be grouped into three categories: acute BVD, in utero infections, and diseases in persistently infected (PI) animals. Acute BVD can vary greatly in presentation from fever, depression, and runny nose and eyes, to diarrhea to respiratory disease, and can end in complete recovery or death. Infected cattle are more susceptible to many respiratory and intestinal pathogens. In utero infections of BVDV can result in abortion, persistently infected animals, congenital defects, or normal, immunized calves depending on the stage of gestation the cow is in and her immune status when she is infected.

Persistently infected animals can result from in utero infection or by birth from a PI dam. The prevalence of these cattle is low, but their potential to shed large quantities of virus and infect other animals in the herd is tremendous. Persistently infected cows always give birth to PI calves, and cows that have not expressed an immune response to BVDV are much more likely to give birth to PI calves. PI calves often are “poor doers”, and are more susceptible to other calf hood diseases due to the immunosuppressive effects of BVDV. Sometimes, however, PI calves may appear normal and healthy. PI calves reportedly have death rates of 50 percent in the first 12 months of life.

BVDV rapidly loses infectivity outside the host, and is very susceptible to detergents, light, temperature changes and other environmental conditions. It is mainly transmitted by close contact with persistently infected or acutely infected cattle via the oral or nasal routes. Acutely infected animals only shed the virus for about 2 weeks, whereas PI animals shed constantly in all bodily secretions for life. Needles, rectal sleeves, water troughs, feed bunks, and other equipment can aid in viral spread.

Adding persistently infected animals to a herd should be avoided as they are the primary method of introducing BVDV into a herd. Replacement animals should be purchased from herds with accurate records of disease prevention and vaccination. All new animals, such as bulls and replacement heifers, should be isolated and tested for BVDV before entering the herd.

Vaccination programs are essential to decreasing losses to BVD. The goal of any vaccination program is to prevent fetal infection and increase colostrum immunity from the mother. This may not always work, depending on the strain of vaccine and the field strain, but it is the best weapon currently available. Vaccination does not clear persistent infections from a herd, but the virus does not spread as quickly through a vaccinated herd.

The two types of vaccine available are modified live (MLV) and inactivated (killed), and controversy exists over which is better. Neither MLV nor inactivated vaccines give lifelong protection, and yearly boosters are required with both. There is no one vaccination program for all situations. Producers should consult their veterinarian for a program tailored to their herd.

The above information comes from the K-State Research and Extension publication “Bovine Virus Diarrhea” MF-2435. This publication is available on the Kansas State Research and Extension website or in your local Extension office. Always work with your local veterinarian on herd health issues.

Laura Phillips
District Extension Agent, Horticulture

What Our Warm Weather Means for Trees

Last week I wrote about what our extreme cold and snow storms might have done to our trees. In case you missed it, the odds are that your trees were deep enough in their dormancy cycle that the cold did not affect them. Now we are in the midst of sunny, 60°F days. What does this mean for our trees who just endured extremely cold temperatures to now have such warm weather?

First, let's look at the dormancy cycle. When days start getting shorter and cooler, trees enter a pre-dormancy phase, where they are undergoing changes that prepare them to endure the cold. This process can take a while, and trees often reach peak dormancy in December or January. Once spring hits and temperature rise, plants start to de-acclimate to the cold, and undo the winterization processes from the fall. When temperatures hit 60°F they start to de-acclimate slowly, and when temperatures hit 70°F de-acclimate proceeds much faster.

So, while it might seem counterintuitive, our current warm weather is more worrying than the cold spell from earlier in January. Plants can lose their cold hardiness if there are unseasonably warm temperatures - especially for multiple days in a row. Some research suggests that it only take a few days of warm weather for trees to start waking up from dormancy.

Unfortunately, it is much harder for the tree to go back into dormancy, or re-acclimate, than it is to leave dormancy, or de-acclimate. Many trees can reacclimate to cold weather, but it requires a slow drop in temperatures for them to do so. Should the temperatures drop back down quickly in the coming weeks, some of our trees may be at high risk for winter damage.

There is not a lot that we can do to help our trees right now, as we cannot change the weather. If we experience a very quick drop in temperature, you can try covering shrubs and smaller trees with burlap or cloth to help keep them warm. Still, odds are you will have to deal with the frost damage that might occur. You might not know that your tree has suffered frost damage until later in the season when the growing season starts and the dead limbs become apparent.

While this is not the ideal situation, it is important to remember that frost damage does not usually kill healthy, well-established trees and shrubs. It only causes a temporary setback. Pruning off any dead or damaged branches and ensuring that your tree gets enough moisture and nutrients in the spring and summer can help it to bounce back.

If you have any questions or concerns about your trees or how to care for them, remember that you can always reach out to your local extension office for more guidance.

Teresa Hatfield
District Extension Agent, Family and Community Wellness

Building Connections: Staying Socially Active During the Winter

January was a rough month for winter weather this year. And although it is normal for Kansas, it doesn't change the fact that it tends to limit our contact with others. When the roads are icy, plans change, and we have to cancel events, and we tend to stick closer to home. There are ways we can continue to stay connected with our friends and family during the winter months. With Valentine's Day in just a few days, think about someone who may be lonely or needs to hear a friendly voice. There are several ways to reach out to others; consider the following ideas to connect.

In 2020, during the COVID-19 pandemic, many of us learned to use technology to stay connected. We met using applications such as Zoom, FaceTime, and Skype. We can still utilize these technologies to connect with family and friends who do not live close by or who may be isolated.

Consider pulling out your pen and stationery, writing an old-fashioned letter, or making a homemade card. We can often express ourselves differently or better when writing a letter. A young child or grandchild may feel special when they receive a letter or card from you in the mail.

Call or visit a friend that you haven't seen in a while. If you know someone who is socially isolated, try to reach out to them. That phone call or visit may be just what they need to lift their spirits. Individuals in long-term care or assisted living facilities often appreciate visits from old friends, church members, and family. Bring them a Valentine's card or something special like a sweet treat.

Think about putting together a care package to brighten someone's day. A box or basket with specially selected items and handwritten notes will warm a winter day.

Find places in your community to connect with others. You can find places to connect through clubs, church groups, senior centers, or casual settings such as getting together with friends to play card or board games. Donate your time to volunteering. Look for activities that allow you to interact with others that you enjoy. Being around others is excellent for your physical and mental health.

You could also ask a friend to take a walk and have a good conversation. Exercise helps improve your mood and body. K-State Research and Extension offers opportunities for social interaction through classes and programs to improve your physical and mental health. Beginning in March, we will start the "Walk Kansas" program. Walk Kansas is a great way to exercise and connect with others. Look for more details in the next few weeks to see how you can participate.

As you can see, there are many ways to connect during the cold and gloom of winter. By utilizing these suggestions, you will find a way to stay connected this winter. Remember, spring will be here before we know it.

Cindy Williams
District Extension Agent, Food, Nutrition, Health and Safety

Eating Healthy Can Equal Cost Savings

Sometimes putting dollars behind the message can really motivate people to change behaviors. That's what a study published in the Journal of Academy of Nutrition and Dietetics found regarding the reduction of health costs when eating a quality diet. This study is the first of its kind to associate cost savings to healthy eating.

This study looked at two eating patterns recommended by the 2015-2020 Dietary Guidelines for Americans. They included the Healthy US-Style and the Healthy Mediterranean-Style diets. Health issues evaluated include reductions in cardiovascular disease, cancer, type 2 diabetes, Alzheimer's disease and hip fractures.

The overall results showed cost savings ranged from \$16.7 billion to \$31.5 billion. This is based on a 20 percent increase in the following the Mediterranean diet and Healthy US-Style respectively. That increase reduced cardiovascular disease, cancer, and type 2 diabetes when following a Healthy US-Style diet and these same diseases plus Alzheimer's disease and hip fracture reduction when following the Mediterranean diet.

I think we all can use a little extra money in our pockets!